

Glossary

7Q10: The lowest average seven-consecutive-day low flow with an average recurrence frequency of once in 10 years determined hydrologically.

Adipose fin: A small, fleshy fin behind the main dorsal fin in bony fish; most common in trout and salmon.

Adverse environmental impact (AEI): Within the context of this case study and the §316(b) regulation, adverse environmental impacts are said to occur whenever there is entrainment or impingement of aquatic organisms due to the operation of a specific cooling water intake structure.

Aerobic: Requiring the presence of free oxygen to support life.

Agnathan: Any member of the vertebrate class Agnatha, the jawless fishes.

Air/swim bladder: A large, thin-walled sac in many fish species that may function in several ways, e.g., as a buoyant float, a sound producer and receptor, and a breathing organ.

Anal fin: The median, unpaired fin on the ventral margin between the anus and the caudal fin in fishes.

Alevin(s): A young fish; especially a newly hatched salmon when still attached to the yolk sac; In North America alevins are sometimes called 'sac-fry.'

Algal blooms: The exponential growth of algal populations in response to excessive nutrient input. Algal blooms can adversely affect water quality.

Amphipods: A group of mostly small (5 to 20 mm), predominantly marine crustacean species characterized by a laterally-compressed, many-segmented body; most live on or in bottom substrates.

Anadromous: Pertaining to fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn, for example, salmon, steelhead, and shad. Contrast with catadromous.

Anoxic: Absence of oxygen. Usually used in reference to an aquatic habitat.

Anthropogenic: Coming from or associated with human activities.

Anus: The opening at the lower end of the alimentary canal, through which the solid refuse of digestion is excreted to the outside.

Aortic arch: One member of a series of paired, curved blood vessels that arise from the ventral aorta, pass through the gills, and join with the dorsal aorta.

Arteries: Blood vessels that carry blood away from the heart to all parts of the body.

Arterioles: The smallest branches of an artery, which eventually merge with capillaries.

Arthropods: An extremely large group of related terrestrial and aquatic invertebrate species; well-known aquatic representatives, all of them crustaceans, include shrimps, copepods, crabs, mysids, and amphipods.

Atrium: A muscular heart chamber that receives blood from the veins and in turn pumps it into the ventricle.

Axial musculature: The large muscle mass that runs from head to tail on both sides of the body in fish. It is the power plant responsible for swimming, and typically represents up to half the mass of a fish.

Bayou: A sluggish marshy inlet or outlet associated with a lake, river, or other surface water body.

Benefits transfer: An approach to valuing an environmental improvement in which the results of existing research on the benefits of an environmental improvement are applied to estimate the benefits in a different, but similar, situation.

Benthic: Adjective that refers to something of or pertaining to benthos. See also: Benthos.

Benthic invertebrates: Those animals without backbones (e.g. insects, crayfish, etc.) that live on or in the sediments of an aquatic habitat.

Benthic zone: The lowermost region of a freshwater or marine profile in which the benthos resides. In bodies of deep water where little light penetrates to the bottom the zone is referred to as the benthic abyssal region and productivity is relatively low. In shallower (i.e. coastal) regions where the benthic zone is well lit, the zone is referred to as the benthic littoral region and it supports some of the world's most productive ecosystems.

Benthos: Plants or animals that live in or on the bottom of an aquatic environment such as an estuary.

Bequest (value): The value that people place on conserving a natural resource for use by future generations.

Best technology available (BTA): The best technology treatment techniques for field application, taking cost into consideration.

Bile: A bitter, alkaline, yellow or greenish liquid secreted by the liver, that aids in absorption and digestion, especially of fats.

Biocide: A chemical which can kill or inhibit the growth of living organisms such as bacteria, fungi, molds, and slimes.

Biological oxygen demand (BOD): The amount of dissolved oxygen consumed by microorganisms as they decompose organic material in polluted water.

Biological surplus: In fisheries, the annual excess of organisms that can be harvested without reducing future productivity.

Biomass: (1) the amount of living matter in an area, including plants, large animals and insects; (2) plant materials and animal waste used as fuel.

Blood: The fluid pumped throughout the body by the heart; it consists of plasma in which red blood cells, white blood cells, thrombocytes, and other specialized cell types are suspended.

Blood plasma: The plasma or liquid portion of blood.

Brackish: Having a salinity between that of fresh and sea water.

Branchial cavity: The area in the mouth containing the gills in fish.

Buccal cavity: The inner cavity associated with the mouth.

Buoyancy: The ability to float or rise in a fluid.

Buoyant: Having buoyancy; capable of floating.

Cannibalism: Animals eating other members of their own species.

Capillaries: Tiny blood vessels, usually < 1mm long, with a diameter no wider than a single red blood cell; they form dense networks that connect arterioles and venules, and are the site for physiological exchange with individual cells.

Carapace: Shell, as in a turtle shell or crab shell.

Cartilage: A firm, elastic, flexible type of connective tissue of a translucent whitish or yellowish color.

Cartilaginous: Pertaining to cartilage.

Cartilaginous ray: A supporting rod in fish fins made from cartilage.

Catadromous: Descriptive of fish species which mature in freshwater environments but migrate to the ocean to spawn.

Caudal fin: The tail of a fish, used mainly to generate forward propulsion.

Caudal peduncle: A narrow, stalk-like structure connecting the tail to the posterior end of the fish's body.

Central nervous system (CNS): The part of the nervous system comprising the brain and spinal cord.

Chloride cell: A specialized cell located in the gills and used by both salt- and freshwater fish to regulate internal salt balances.

Chondrichthyes: The class of vertebrates composed of cartilaginous fish species, including sharks, rays, skates and chimaeras.

Chromatophores: A group of specialized pigment cells located in the dermis, partially responsible for coloration in fish.

Circulatory vessels: A tube of the circulatory system, such as an artery or vein, which contains or conveys blood.

Closed-cycle (cooling system): A cooling water system in which heat is transferred by recirculating water contained within the system.

Cohort: A group of individuals having a statistical factor (as age or class membership) in common in a demographic study.

Colonial: Term describing the habit by certain bird species to nest in large groups called colonies.

Combined sewer overflow (CSO): Discharge of a mixture of storm water and domestic waste when the flow capacity of a combined sewer system is exceeded during rainstorms.

Cone: One of two types of light-sensitive cells located in the retina of the eye; sensitive to color and light intensity.

Confluence: The area where two or more streams or rivers join together

Conjoint analysis: A method for using surveys to determine the values that people place on a good by asking them to choose between several combinations of environmental quality and the cost of providing that level of quality.

Consumer surplus: The extra value that consumer would be willing to pay for a good beyond the good's actual sale price.

Consumptive use: The loss of water through various processes, including:

Consumptive use (of water): Refers to water use practices whereby water is not returned to its source due to loss from evaporation, evapotranspiration, or incorporation in a manufacturing process.

Continental shelf: Part of the continental margin. the ocean floor from the coastal shore of continents to the continental slope, usually to a depth of about 200 meters. The continental shelf usually has a very slight slope, roughly 0.1 degrees.

Contingent valuation method (CVM): A stated preference method for using surveys to ask people what they would be willing pay for a non-market good (especially an environmental good) contingent on a specific hypothetical scenario and description of the good.

Conus arteriosus: Muscular heart chamber responsible for passing blood from the ventricle into the ventral aorta, toward the gills.

Cooling water intake structures (CWISs): The total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source to the first intake pump or series of pumps.

Copepods: A large group of planktonic or benthic crustacean species; one defining characteristic of this group are the single or double egg sacs carried posteriorly by the females.

Cornea: The transparent, exterior part of the eye located in front of the pupil.

Countercurrent exchange: The transfer of heat or gases between currents of blood passing by one another in capillary beds; the beds run parallel to each other but in opposite directions.

Cranium: The part of the skull that encloses the brain.

Critical habitat: Term used in the Federal Endangered Species Act to denote the whole or any part or parts of an area or areas of land comprising the habitat of an endangered species, an endangered population or an endangered ecological community that is essential for the survival of the species, population or ecological community.

DDT: Dichlorodiphenyltrichloroethane is a chlorinated pesticide which is banned in the U.S.

Demersal: (1) Dwelling at or near the bottom of a body of water, such as demersal fish. (2) Sinking to or deposited near the bottom of a body of water, such as demersal fish eggs.

Demersal egg: A fish or aquatic invertebrate egg that sinks to the bottom.

Dermal denticles: Small, toothlike scales covering the skin of most sharks, skates, and rays, giving their skin the feel of sandpaper.

Dermis: The dense inner layer of skin underneath the epidermis.

Dermo: A disease caused by a single-cell organism (protozoan) that infects oysters. (<http://www.bayjournal.com/95-04/oyster1.htm>)

Desiccation: The loss of water from pore spaces of sediments through compaction or through evaporation caused by exposure to air.

Diatoms: Any of the microscopic unicellular or colonial algae constituting the class Bacillarieae. They have a silicified cell wall, which persists as a silica skeleton after death and forms kieselguhr (loose or porous diatomite). Diatoms occur abundantly in fresh and salt waters, in soil, and as fossils. They form a large part of plankton.

Dinoflagellates: Any of numerous, chiefly marine, plankton of the phylum Pyrrophyta (or, in some classification schemes, the order Dinoflagellata), usually having flagella, one in a groove around the body and the other extending from its center.

Direct use benefits: The benefits that people derive from the use (or consumption) of a good.

Dissolved oxygen (DO): Oxygen gas which is dissolved in the water column and available for breathing by aquatic organisms; DO levels vary by temperature, salinity, turbulence, photosynthetic activity and internal oxygen demand.

Diurnal: Pertaining to fish and other species that are active during the day (opposed to nocturnal).

Dorsal aorta: A major blood vessel in fish, which carries oxygenated blood from the gills to the rest of the body.

Dorsal fin: The fin(s) present on the back of most fish.

Dorsal musculature: That part of the axial musculature located above the horizontal septum.

Ecological niche: The portion of the environment which a species occupies. A niche is defined in terms of the conditions under which an organism can survive, and may be affected by the presence of other competing organisms.

Ecosystem: All the organisms in a particular region and the environment in which they live. The elements of an ecosystem interact with each other in some way, and so depend on each other either directly or indirectly.

Effector cell: A cell that carries out a response to a nerve impulse.

Effluent: Wastewater — treated or untreated — that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Endemism: Native to a particular area or region.

Endocrine system: An integrated group of glands that releases hormones into the blood stream.

Endolymph: The fluid contained within the canals and sacs of the inner ear.

Entrainment: The incorporation of fish, eggs, larvae, and other plankton with intake water flow entering and passing through a cooling water intake structure and into a cooling water system.

Environmental stressor: A physical or chemical disturbance that changes the quality of terrestrial or aquatic habitats

Epidermis: The outer layer of the skin.

Epipelagic (zone): The uppermost, normally photic layer of the ocean between the ocean surface and the thermocline, usually between depths of 0-200 m; living or feeding on surface waters or at midwater to depths of 200 m.

Epithelium: Any animal tissue that covers a surface or lines a cavity, and which performs various secretory, transporting, or regulatory functions.

Equilibrium population: Population in a state of balance.

Esophagus: A muscular tube connecting the mouth to the stomach.

Estuarine: Living mainly in the lower part of a river or estuary; coastlines where marine and freshwaters meet and mix; waters often brackish (i.e., mixohaline, with salt content 0.5 - 30%).

Euryhaline: Descriptive term for an organisms that can tolerate wide ranges in salt concentrations.

Eutrophication: The uncontrolled growth of aquatic plants in response to excessive nutrient inputs to surface waters; the process of enrichment of water bodies by nutrients.

Evapotranspiration: The loss of water from the soil both by evaporation and by transpiration from the plants growing in the soil.

Existence value: The value that people derive from knowledge that a good exists, even if they do not use it and have no plans to use it.

Exotic species: Species that evolve in one region of the world but are intentionally or accidentally introduced in another, where they lack natural enemies and can take over local ecosystems.

Extinction: The death of an entire species.

Fecundity: Number of eggs an animal produces during each reproductive cycle; the potential reproductive capacity of an organism or population.

Filter feeding: A food gathering strategy which consists of passing water over gill structures to strain out food particles.

Fish consumption advisories: Limitations imposed by regulatory agencies on the number of fish or shellfish meals that can be consumed by particular segments of the general population, due to the presence of chemical residues in the target organisms.

Fledging: Period in a bird's life from hatching to first flight.

Fledgling: Young bird in the fledging stage.

Food web: All the interactions of predator and prey, included along with the exchange of nutrients into and out of the soil. These interactions connect the various members of an ecosystem, and describe how energy passes from one organism to another.

Forage: Prey or food species of an animal.

Fry: Newly hatched young fish.

Gall bladder: A small sac, located in the liver, that stores and concentrates bile.

Gill bar: One of a series of bony or cartilaginous arches on each side of the pharynx that support the gills; also referred to as “branchial arches.”

Gill filament: One of a series of structures that project out of a gill bar and support numerous gill lamellae.

Gill lamellae: Tiny, parallel, thin-walled and leaf-like projections which cover the gill filaments; these are the actual locations within the gill where gases are exchanged between water and blood.

Gill netting: A passive fish capturing device which uses vertical walls of netting set out in a straight line; capture is based on the fortuitous encounter of aquatic organisms with the net.

Gill raker: Stiff projections along the inner margins of the branchial arches; some fish species use these structures to strain incoming food particles.

Gill septum: Flap-like gill cover in cartilaginous fish, which prevents oxygen-poor water from being drawn back into the branchial cavity during breathing.

Glycogen: The principal carbohydrate storage material in animals.

Gonads: Generic name for sex organs (ovaries and testes).

Growth rate: Rate of change over time the body mass or body length of a species.

Habitat-based replacement costs (HRC): Method which determines the cost of offsetting ecological losses by increasing production of those resources through restoration of natural habitats.

Habitat equivalency analysis (HEA): A service-to-service approach for restoration scaling that quantifies changes in the flow of services from natural resources while accounting for the magnitude, timing, and duration of those service flow changes over time.

Haemal spines: The ventral spine in the caudal vertebra.

Heart: A hollow, multi-chambered, muscular organ used for pumping blood throughout the circulatory system.

Hemoglobin: Iron-rich protein packed in red blood cells; responsible for carrying oxygen to the tissues and removing carbon dioxide.

Heteroskedasticity: A condition in regression analysis in which the size of the error term is correlated with one or more explanatory variables, potentially creating biased regression estimates.

Horizontal septum: A tough membrane dividing the axial musculature into dorsal and ventral halves.

Hybridize: To crossbreed between two different species.

Hydrodynamics: The study of fluid motion and fluid-boundary interaction.

Ichthyoplankton: Earliest life stages (chiefly eggs and larvae) of certain fish species which remain suspended in the water column as plankton for up to several weeks.

Imbricate scale: A type of scale in fish, which overlaps like tiles on a roof.

Impingement: The entrapment of aquatic organisms on the outer part of an intake structure or against a screening device during periods of intake water withdrawal.

Inelastic: Not elastic; slow to react or respond to changing conditions.

Inner ear: Equilibrium organ located in the skull.

Integument: Covering or skin.

Intertidal: The area along the coastline exposed to the air and submerged by the sea during each tidal cycle.

Intestine: The lower part of the alimentary canal, extending from the pyloric caeca to the anus.

Invertebrate: Animals that lack a spinal column or backbone, including mollusks (e.g., clams and oysters), crustaceans (e.g., crabs and shrimp), insects, starfish, jellyfish, sponges, and many types of worms.

Invertebrate drift: Invertebrates that float with the current.

Kidneys: In fish, a pair of elongated organs that run along the dorsal part of the abdominal cavity; they form and excrete urine, regulate fluid and electrolyte balance, and act as endocrine glands.

Lacustrine: Related to open freshwater bodies such as lakes, reservoirs, and impounded rivers.

Lateral line: The line, or system of lines, of sensory organs located along the head and sides by which fish detect water current and pressure changes and vibrations.

Lens: A transparent spherical object in the eye, situated behind the iris, which focuses incoming light on the retina.

Leptocephali: A colorless, transparent, flattened larva, esp. of certain eels and ocean fishes.

Leptoid scale: A type of scale found mostly in higher bony fish.

Limnetic (zone): Surface layer where most photosynthesis takes place.

Littoral (zone): Shallow nearshore region defined by the band from 0 depth to the outer edge of rooted plants.

Liver: A large, reddish-brown, glandular organ with multiple functions, including: bile secretion, fat and carbohydrate storage, yolk manufacture, blood detoxification, blood cell production, and other metabolic processes.

Lymph: A clear, yellowish fluid formed from liquid constituents of blood that have leaked out of capillaries and into the surrounding tissues.

Lymphatics: A network of vessels for returning lymph back to the circulatory system.

Macula: A sensory tissue found in inner ear sacs and canals.

Mangrove: One of several different species of semi-aquatic trees growing along marine and estuarine shorelines in tropical and subtropical regions of the world; also refers to the habitat created by these trees.

Marine: Refers to the ocean.

Mean: Arithmetic average computed by dividing the sum of a set of terms by the number of terms.

Mean annual flow: The average of daily flows over a calendar year.

Median: A value in an ordered set of values below and above which there is an equal number of values or which is the arithmetic mean of the two middle values if there is no one middle number.

Median fin: See vertical fin.

Mesohaline: Water with a salt content ranging between 5 and 18 parts per thousand (ppt).

Metric: A standard of measurement.

Migration: The movement of animals in response to seasonal changes or changes in the food supply.

Mollusks: A large group of invertebrate species; major subgroups in freshwater habitats are represented by gastropods (i.e., snails) and bivalves (i.e., clams and mussels).

Monetization: In the context of this rulemaking, the process of placing a monetary value on a physical environmental change.

Monte Carlo: A stochastic modeling technique that involves the random selection of sets of input data for use in repetitive model runs. Probability distributions are generated as the output of a Monte Carlo simulation.

Mortality rate: Death rate. Includes **Natural mortality Rate** and **Fishing mortality rate**.

Mosaic scale: *An arrangement whereby scales do not overlap but instead abut each other like pieces in a mosaic.*

Mouth: The opening through which food and water passes into the buccal cavity of fish.

MSX: A disease caused by a protozoan that infects oysters.

Mud flats: An intertidal area characterized by soft, muddy substrate; typically found along tidal creeks or in quiet backwaters.

Muscle segment: a.k.a. myomeres; a block of muscles, the contraction of which produces movement in the body.

Myomeres: Individual W-shaped muscle blocks that are a part of the axial musculature.

Mysids: Small (<3 cm), shrimp-like crustaceans of the order Mysidacea that go by the common name of opossum shrimp; they are morphologically similar to crayfish but have greatly elongated and modified appendages for use in active swimming.

Nasal pit: One or two small depressions in the head region of fish, which contain the olfactory epithelium.

Navigation pool: A long stretch of river maintained at a minimum depth by a dam, and accessible via one or more gated locks.

Nearctic: Designates a biogeographic subregion which includes the arctic and temperate parts of North America and Greenland.

Nematodes: Unsegmented round worms, some of which are parasitic.

Neritic Province: Area over the continental shelf.

Neural circuitry: The intricate and interconnected web of nerves that make up the nervous system.

Neural spine: A thin, upward-facing bony outgrowth of the vertebrae in most fish species.

Neuromast: A group of sensory cells that together make up the lateral line.

Non-consumptive use (of water): Refers to water use practices whereby water is returned to its source after it has been used.

Non-native species: a.k.a. exotic or invasive species; these terms refer species which evolve in one region of the world but are intentionally or accidentally introduced in another where they lack natural enemies and can take over local ecosystems.

Non-response bias: Potential bias in survey results that occurs when people who choose not to respond to a survey would have answered in ways that significantly differ from those who did respond.

Nonuse benefits: The value that people derive from a good that they do not use (types of non-use benefits include bequest value, existence value, and option value).

Notochord: A stiff, rod-like structure that provides the major axial support in the body of adult lower chordates, including cyclostomes.

Nursery habitat: Any one of a number of aquatic habitats used by the early lifestages of many fish and invertebrate species to complete their development or find food and shelter.

Oceanic Province: A pelagic division of the ocean, located beyond the continental shelf.

Ocular fluid: The transparent liquid that fills the inside of the eye.

Olfaction: The sense used to perceive and distinguish odors.

Olfactory bulbs: That part of the brain involved with the sense of smell.

Olfactory cell: A specialized cell used to detect the presence of odor molecules.

Olfactory epithelium: The collection of olfactory cells, supporting cells, mucus glands, and nerve endings located inside the nasal pit.

Oligohaline: Water with salinity ranging between 0.5 to 5 parts per thousand (ppt) .

Omnivorous: Feeding on both animals and plants.

Open-cycle (cooling system): A cooling water system in which heat is transferred using water (fresh or saline) that is withdrawn from a river, stream or other water body (man-made or natural), or a well, that is passed through a steam condenser one time, and then returned to the stream or water body some distance from the intake. Typically, such waters are required to be cooled in cooling ponds before returning to a stream or other body of water. Also referred to as once-through cooling.

Operculum: The bony gill cover of fishes which prevents oxygen-poor water from being drawn back into the branchial cavity during breathing.

Optic nerve: A bundle of sensory tissue that conducts electrical impulses from the retina to the brain.

Ornithological: Of, or relating to birds.

Osmoregulation: The process by which organisms maintain a proper internal fluid and salt balance.

Osmoregulatory adjustment: An change in the internal fluid and salt balance of fish in response to fluctuations in external salt concentrations.

Ossified: Hardened like or into bone.

Osteichthyes: The class of lower vertebrates comprising the bony fishes.

Otolith: A small mass of calcified material deposited on top of the macula within the inner ear.

Ova: Plural of ovum; egg or female gamete.

Paired fins: Pectoral fins, placed just behind the gills, and the pelvic fins, variable in position and sometimes lacking entirely.

Pancreas: A gland, situated near the stomach, that secretes digestive juices into the intestine through one or more ducts.

Parr: Life stage of fish between the fry and smolt stages where ovoid parr markings are well developed along the side of the fish; a young salmon or trout living and feeding in freshwater, before the migration to a sea.

Pathogen: An organism (usually microbial) capable of inducing disease in humans or wildlife receptors.

Pectoral fin: Either of a pair of fins usually situated behind the head, one on each side of the fish.

Pelagic: Referring to the open sea at all depths (pelagic animals live in the open sea and are not limited to the ocean bottom).

Pelagic egg: A fish or aquatic invertebrate egg that stays suspended in the water column for part or whole of its development.

Pelvic fin: Either of a pair of fins on the lower surface of the body located behind the pectoral fins.

Pelvic girdle: A bony or cartilaginous arch supporting the pelvic fins.

Percentile: A value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it.

Peripheral nervous system: The portion of the nervous system lying outside the brain and spinal cord.

Pharyngeal region: The area of the mouth located near the pharynx.

Pharynx: The part of the throat into which the gill slits open.

Photic (zone): Zone where light is sufficient for photosynthesis; in oceanic waters above approximately 200 m in depth.

Photosynthesis: The process in green plants and certain other organisms by which carbohydrates are synthesized from carbon dioxide and water using light as an energy source. Most forms of photosynthesis release oxygen as a byproduct. Chlorophyll typically acts as the catalyst in this process.

Phytoplankton: Small, often single-celled plants that live suspended in bodies of water (e.g., estuaries).

Piscivorous: Feeding on fish.

Placoid scale: Another name for dermal denticle.

Planktivorous: Feeding on plankton.

Planktonic: Free-floating. Plankton are tiny free-floating organisms.

Pneumatic duct: The duct connecting the air bladder to the gut in the adults of certain fish species.

Polychaetes: Scientific name for marine worms.

Polychlorinated biphenyls (PCBs): A large group of related chemicals with oil-like properties which were widely used in the past in electrical transformers.

Polycyclic aromatic hydrocarbons (PAHs): A large group of related chemicals characterized by multiple ring structures; derived mainly from crude oil or from combustion processes.

Potamodromous: Fish that migrate from lakes up rivers or streams, like salmon, walleye, and white bass.

Predator: Organism which hunts and eats other organisms. This includes both carnivores, which eat animals, and herbivores, which eat plants.

Prey: Organism hunted and eaten by a predator.

Primary consumer: An organism that feeds mostly on plant material; all herbivores are primary consumers.

Primary productivity: Transformation of chemical or solar energy to biomass. Most primary production occurs through photosynthesis, whereby green plants convert solar energy, carbon dioxide, and water to glucose and eventually to plant tissue.

Producer surplus: The extra value that producers receive for a good beyond the price they would be willing to sell the good for.

Profundal (zone): Deep-water zone in lakes or oceans that is not penetrated by sunlight.

Propagule: A floating structure used for reproduction in sea grasses and other aquatic plant species; the propagule is transported by currents and takes root when reaching a favorable habitat.

Protrusible mouth: A mouth that projects forward as a tube when opened.

Purse seine: A large seine, for use generally by two boats, that is drawn around a school of fish and then closed at the bottom by means of a line passing through rings attached along the lower edge of the net.

Pyloric caeca: A number of finger-like extensions located at the end of the stomach in bony fish species, which probably help in food digestion and absorption.

Recall bias: Potential bias in a survey results that occurs when participants provide false information because they cannot (or incorrectly) remember their actions in the past.

Receptor cells: A class of cells of the nervous system that specialize in detecting external stimuli.

Recruitment: Usually refers to the addition of new individuals to the fished component of stock. It may also refer to new additions to sub-components, e.g., 'recruitment to the fishery' refers to fish entering the actual fishery, and this is determined by the size and age at which they are first caught.

Rectum: The comparatively straight, terminal section of the intestine, ending in the anus.

Red blood cells: One of several types of cells that make up blood; they are packed with hemoglobin and carry oxygen to the cells and tissues and carbon dioxide back to the respiratory organs.

Red body: The blood-rich organ that secretes gases into the swim bladder.

Red tide: The explosive growth of toxic unicellular algae which can cause the affected surface waters to turn reddish.

Replacement cost: The cost of replacing the services provided by an environmental good that has been damaged or destroyed.

Restoration: The return of an ecosystem or habitat to its original community structure, natural complement of species, and natural functions.

Rete mirabile: A dense bundle of countercurrent capillaries located in the red body; it extracts gases from the incoming blood for secretion into the swim bladder.

Retina: The light-sensitive tissue at the back of the eye that receives the image produced by the lens; contains the rods and cones.

Revealed preference: Refers to a class of valuation methods that analyze consumer purchases of a good (especially housing) to determine the values they place on the characteristics of the good.

Riparian: Having to do with the edges of streams or rivers.

River debit: The volume of water which flows downstream during a certain period of time.

Riverine: Living in a river; living in flowing water.

Rod: One of two types of light-sensitive cells located in the retina; provides vision in dim light or semidarkness.

Rotifer: Any microscopic animal of the phylum (or class) Rotifera, found in fresh and salt waters, having one or more rings of cilia on the anterior end.

Salinity: A measure of the salt concentration of water. Higher salinity means more dissolved salts.

Salt barrens: A type of habitat created when low lying land along a coastline is flooded by spring tides; the area develops into a hyper saline habitat that supports salt resistant terrestrial plants after the sea water recedes or evaporates.

Salt marsh: A tidally-influenced semi-aquatic habitat which supports salt tolerant plant species.

Secchi disk: A 20 cm-wide black and white round plastic disk which is lowered into the water to measure the transparency of the water column.

Sedge: Any rushlike or grasslike plant of the genus *Carex*, growing in wet places.

Sedimentation: (1) Strictly, the act or process of depositing sediment from suspension in water. Broadly, all the processes whereby particles of rock material are accumulated to form sedimentary deposits. Sedimentation, as commonly used, involves not only aqueous but also glacial, aeolian, and organic agents. (2) (Water Quality) Letting solids settle out of wastewater by gravity during treatment.

Sinus venosus: The heart region that collects incoming oxygen-poor blood and passes it on to the atrium.

Skull: The bony framework or skeleton of the head, enclosing the brain and supporting the face.

Smolt: The post-parr form in which the young of sea-going fish (especially trout and salmon) migrate from freshwater to the sea.

Spartina: A genus of salt-tolerant grasses found in coastal regions.

Spawning / spawn: Release or deposition of spermatozoa or ova, of which some will fertilize or be fertilized to produce offspring; fish reproduction process characterized by females and males depositing eggs and sperm into the water simultaneously or in succession so as to fertilize the eggs.

Speciation: Formation of new species, through reproductive isolation?

Species diversity: Number, evenness, and composition of species in an ecosystem; the total range of biological attributes of all species present in an ecosystem.

Species evenness: The distribution of individual organisms among the species present in a sample or area; evenness is low when most individuals belong to a few species, as is often the case in disturbed or contaminated environments. Evenness increases when the organisms belong to many different species, as is the case in more pristine environments.

Species richness: The number of species present in a sample.

Sphincter: A circular band of voluntary or involuntary muscle that encircles an orifice of the body or one of its hollow organs.

Spinal cord: The thick bundle of nerve tissue that comes from the brain and extends through the spinal column.

Spine: The spinal or vertebral column; also referred to as the backbone.

Spiral valve: A structure located in the intestine of all Chondrichthyes and some primitive bony fish species, which controls the flow of digested food and enhances the absorption of food molecules.

Spleen: A highly vascular, glandular, ductless organ that serves as a blood reservoir; it also forms mature lymphocytes and removes old red blood cells from the circulatory system.

Squalene: Oil found in the liver of many shark species, which creates buoyancy.

Staging area: Places where birds temporarily stay, feed, and rest during their annual migrations.

Stated preference: Refers to a class of valuation methods that use surveys to elicit the value that people place on non-market good.

Static: Not changing.

Stochastic: Random.

Stock: Group of individuals of a species which can be regarded as an entity for management or assessment purposes; a separate breeding population of a species; term used to identify a management unit of fishery species.

Stomach: A sac-like enlargement of the alimentary canal, forming an organ for storing, diluting, and digesting food.

Stratified random sample: A sample in which the survey population is separated into several groups (or strata) and then subjects are randomly selected from each group.

Striated muscle: The skeletal portion of the muscle tissue; striated muscle forms the bulk of the body's muscle tissue and gives the body its general shape.

Subsistence (fishing or angling): Fishing primarily to supply food (as opposed to fishing for recreation).

Substrate: "Supporting surface" on which an organism grows. The substrate may simply provide structural support, or may provide water and nutrients. A substrate may be inorganic, such as rock or soil, or it may be organic, such as wood.

Subtidal: The area of the ocean or estuary starting at the low tide line and extending outwards; the subtidal zone remains submerged, even during low tide.

Suspended solids: Minute particles (e.g., clay flecks or unicellular algae) present in the water column, which are small enough to resist rapid settling.

Swale: A low place in a tract of land, usually moister and often having ranker vegetation than the adjacent higher land.

Sympatric: Occurring in the same area; capable of occupying the same geographic ranges without loss of identity by interbreeding

Tailwater: The turbulent river water immediately adjacent to or just downstream of a lock and dam (L&D) structure; it includes areas around the lock flushing valves and the dams themselves.

Tapetum: A highly-reflective membrane located in the back of the retina, which enhances night vision.

Taste bud: One of numerous small, flask-shaped bodies, chiefly in the epithelium of the tongue, which are responsible for detecting taste molecules.

Taste pore: The opening of the taste bud to the outside world.

Taxa: Plural of taxon; a taxon is a group of organisms comprising one of the categories in taxonomic classification (i.e., phylum, class, order, family, genus, or species). The term is used when organisms cannot be identified at the species level. Such organisms include larval or juvenile lifestages that do not yet have their adult forms; they can be designated with certainty only at a higher taxonomic level.

Teleost: A subgroup of the bony fish; includes most species of aquarium, sport, and food fish.

Temperate: Moderate climate with long, warm summers and short, cold winters.

Terminal mouth: A mouth located in the front of a fish (as opposed to a sub-terminal mouth, located underneath the head).

Threatened and endangered (species) (T&E): Animals, birds, fish, plants, or other living organisms recognized as threatened with extinction by anthropogenic (man-caused) or other natural changes in the environment. Used interchangeably in this document with “special status species.”

Thrombocytes: One of the three principal types of blood cells found in blood plasma; they help initiate the clotting process.

Tidal range: The difference in height between the average low tide and high tide line.

Trophic cascade: An impact that trickles down through the food web with repercussions for the larger ecosystem; top-down effect of predators on the biomass of organisms at lower trophic levels.

Trophic level: A feeding level in an ecological community; plant eaters are at a lower trophic level than meat eaters.

Trophic transfer efficiency: Proportion of production of prey that is converted to production of consumers at the next trophic level.

Tropical: Climate characterized by high temperature, humidity and rainfall, found in a belt on both sides of the equator.

Turbidity: Suspended particles in a water sample causing light to scatter or absorb; high turbidity may be harmful to aquatic life because it can decrease light penetration and inhibits photosynthesis in the water column.

Urea: A toxic compound occurring in urine as a product of protein metabolism.

Variance: The square of the standard deviation. A measure of the dispersion of data or how much values in a sample differ from the sample average.

Vegetative growth: An asexual reproductive strategy used by sea grasses and other plants; it consists of sending out one or more shoots that grow into new plants in the immediate vicinity of its “parent.”

Vein: One of the system of branching vessels conveying blood from various parts of the body back to the heart.

Ventral aorta: The artery that carries blood from the heart to the aortic arches (Kimmel et al., 1995).

Ventral fin: Either of a pair of fins on the lower surface of the body in fish; variable in position and sometimes lacking entirely.

Ventral musculature: Part of the axial musculature that is located below the horizontal septum.

Ventricle: A muscular heart chamber that receives blood from the atrium and pumps it into the conus arteriosus

Venule: A small vein.

Vertebrae: The bones or segments composing the backbone.

Vertebrate: Any species having vertebrae; having a backbone or spinal column; examples include fish, amphibians, reptiles, birds, and mammals.

Vertical fins: Fins situated along the centerline of the body; include dorsal, anal, and caudal fins.

Visceral nervous system: An additional component of the nervous system that serves the gut, circulatory system, glands, and other internal organs.

Visual pigments: Light-sensitive molecules found in rods and cones within the retina.

Water withdrawal: The removal of water from the ground or diversion from a surface water source for use by agriculture, municipalities, or industries.

Watershed: Drainage area of a stream, river, or lake leading to a single outlet for its runoff; synonymous with catchment.

Weberian ossicles: A chain of bony processes of the anterior vertebrae that connect the swim bladder to the head region in certain fish species.

Welfare gain: In the context of this rulemaking, the benefit to society from an environmental improvement.

White blood cells: One of the three principal types of blood cells found in blood plasma; they fight bacterial infections and other diseases.

Willingness-to-pay: The value that people will pay to obtain a good (usually associated with the results of a stated preference study).

Zooplankton: A generic term referring to the small life stages (i.e., eggs, larvae, juveniles, and adults) of many fish and invertebrate species.

(Sources: Cole, 1983; Goldman and Horne, 1983; Nicholson, 1994; Maryland Department of Natural Resources, 1995; Madigan et al., 1997; San Diego Natural History Museum, 1998; Shaw, 1998; U.S. EPA, 1998c; Water Quality Association, 1999; Childrens Mercy Hospital, 2000; Washington Tourist.com, 2000; Froese and Pauly, 2001; Lackey, 2001; Madzura, 2001; Mouratov, 2001; University of Wisconsin Sea Grant Institute, 2001; Badman's Tropical Fish, 2002; Chapin, 2002; Chudler, 2002; Eckhardt, 2002; Ehlinger, 2002; Encyclopedia Britannica Online, 2002; European Environment Agency, 2002; Fish Endocrinology Research Group, 2002; Greenhalgh, 2002; King and Mazzotta, 2002; Lexico LLC, 2002; Lycos, Inc., 2002; Merriam-Webster Online, 2002; Nature Conservation Council of NSW, 2002; NRDC, 2002; UCMP, 2002; U.S. EPA, 2002c)